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ABSTRACT

For this study, a series of data has been collected covering the total amount of expenditure and its main constituent items. Data are also included for Yugoslavia, an associated member country. In the first chapter, the trend of educational expenditure in each country is measured and, controlling for the effect of price increases, the following expenditure growth factors are identified: the economy growth, the population and enrollment rate increase, the rise in teachers' pay and unit costs, and the change in teacher/student ratio. A "cross-section" analysis of the relationships between the level of educational expenditure and the level of economic development for the whole group of countries in a given year and for particular countries at different points in time is presented. A final chapter incorporates a series of extrapolations of educational expenditures up to 1980 for each O. E. C. D. country in which three different methods have been used and for which the results have been compared. Related documents are: ED 057 470, EA 004 323, EA 004 420, and EA 004 422-425. (Author/JH)

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Background Study No. 2

COMPARATIVE STUDY OF EDUCATIONAL EXPENDITURE AND ITS TRENDS IN O.E.C.D. COUNTRIES SINCE 1950

The present report, compiled by Michel Debeauvais(*) is one of a series of Background Studies prepared by the Secretariat for the Conference on Policies for Educational Growth. The report is completed by:

(a) seven case studies made by expert-consultants in the following countries: United States, France, Norway, Netherlands, United Kingdom, Turkey, Yugoslavia;

(b) a series of country notes with tables of basic financial statistics supplied by National Statistical Departments, together with comments on them and graphs and calculations based on the data in them;

(c) a technical note describing the methods used in making the calculations;

which will be circulated separately.

(*) Assisted by Geraldo Alves do Nascimento, Gisela Emmerij and Michel Monfort. The extrapolations given in Chapter III were made by Asa Sohlman.

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COMPARATIVE STUDY OF EDUCATIONAL EXPENDITURE AND ITS TRENDS IN O.E.C.D. COUNTRIES SINCE 1950

Summary

For this comparative study of educational expenditure in O.E.C.D. countries a series of data has been collected covering the total amount of expenditure and its main constituent items over the past 15 years. The data have been arranged so as to facilitate comparison and to yield more reliable information than that available hitherto.

Although thorough investigations were made in co-operation with National Statistical Departments, many gaps still remain to be filled. They are mentioned in this study to point out that, until now, financial data have been particularly neglected in framing education policies, although modern management and planning techniques are inconceivable without a cost policy, which must itself be based on a thorough knowledge of educational expenditure. Likewise, ignorance about sources of finance other than public funds is an obstacle to working out an overall financial policy.

A. The first step in analysing the assembled data is to measure the trend of educational expenditure in each country. This raises the problem of how to express the expenditure in constant prices, a correct solution of which would presuppose knowledge of the trend of teacher "productivity". In the absence of such knowledge two extreme assumptions have been made: no change in productivity (assumption A), and an increase in line with that of the economy as a whole (Assumption B).

Assumption B, which corresponds to the methods generally used, gives growth rates of over 10 per cent a year for half the O.E.C.D. countries; only three countries have rates under 7 per cent. If assumption A were used, half the countries would not exceed a rate of 7 per cent a year.

The two assumptions lead to such different results that they raise the question of revising the techniques generally used in making financial estimates. Instead of using cost per pupil (often taken to be constant) for converting independently-made estimates of student enrolments into budget estimates, it seems preferable to analyse thoroughly the factors which force educational expenditure upwards and to study recent trends in this connection.

Some examples are given of analysing causes of change by a method which might be applied to global data, but its limitations should be stressed. More thorough cost studies would be required and would permit efficiency criteria to be worked out by which productivity in education could be measured.

It is in higher education that the increase in expenditure has been greatest: the growth rates exceed 12 per cent a year in three-quarters of the countries and are over 14 per cent in five of them (assumption B).

A comparison between these growth rates and the forecasts for 1957-1970 made at the Washington Conference organised by O.E.C.D. ten years ago shows that the rise in educational expenditure has far surpassed the experts' most optimistic assumptions; it has likewise easily exceeded national forecasts. It is therefore important to investigate the factors responsible for this development.

B. From an analysis of the trends in the total figures given in this study it is possible to identify a number of growth factors in expenditure, once the effect of price increases has been eliminated: demographic growth, which has played only a modest part, since the post-war "population explosion" produced rates of population increase much below the rates of increase in the numbers of student enrolments; the much more important increases in enrolment rates, which denote the profound structural changes in the "social demand" for education; the rises in unit costs, which must be attributed to several factors of widely differing importance; the fairly general improvement in the staffing rate (teacher/student ratio); the rise in teachers' pay, to which most of the increase in costs is to be ascribed. But the salary increases must not be interpreted in too global a way and need a detailed analysis: the rise in average salaries (at constant prices) is largely reflected in a general improvement in teachers' purchasing power but there are also other factors of great importance, such as changes in the distribution of teachers among different levels of qualification, trends in age structure, etc. Not having had the necessary data, the author is doing no more here than suggesting a method which might be used to investigate these factors of change.

C. Next, an attempt is made to define the relationship between the rise in educational expenditure and economic growth on the one hand, and the rise in public expenditure on the other. The calculations give regression equations which show how extremely close is the statistical connection between the trends of these three magnitudes; it is also seen that public expenditure has increased one-and-a-half times as fast as the G.N.P. in 14 countries out of 18, and twice as fast in eight of them. One finds similar rates of growth when one compares trends in educational expenditure with those in total public expenditure.

D. We can now draw a comparison between levels of educational expenditure in the different countries and start by investigating the percentages of national resources spent on education, having due regard to the difficulties of definition which often

vitiate comparisons. One then studies the "cross-section" relationships between the level of educational expenditure and the level of economic development for the whole group of countries in a given year, or with a timelag. It is suggested, however, that in spite of satisfactory statistical relationships, an overall analysis of this kind is far too scanty to establish a meaningful relationship between education and economic growth in order to show that educational expenditure is an investment which favours economic growth, or to prove the contrary.

Nor is it found that differences observed between growth rates in educational expenditure from one country to another seem to be due to rates of economic growth, or to "spurts" by countries which had the lowest expenditure levels at the start of the period considered and wanted to catch up.

A study of the overall financial magnitudes is thus not enough to formulate a definition of the objectives of educational expenditure.

E. In the last part of the study a series of extrapolations of educational expenditure is made for each of the O.E.C.D. countries up to 1980, using three different methods and comparing the results they yield. In interpreting these projections (which cannot be regarded as proper forecasts) a distinction is made between three groups of countries: in the first, the rapid growth of educational expenditure seems likely to reach a limit soon; in the second, the rate of growth is likely to slow down during the decade, but one cannot say by what date; in the third, the expansion seems capable of continuing and even accelerating during the next ten years.

In conclusion, it should be stressed that a better knowledge of educational expenditure seems necessary for providing those in charge of the educational system with the minimum of essential information they, at present, lack; but this can be only a first step towards making it possible to undertake cost studies in conjunction with efficiency studies and to tackle the problems relating to a policy of financing.

COMPARATIVE STUDY OF EDUCATIONAL EXPENDITURE AND ITS TRENDS IN O.E.C.D. COUNTRIES SINCE 1950

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COMPARATIVE STUDY OF EDUCATIONAL EXPENDITURE AND ITS TRENDS IN O.E.C.D. COUNTRIES SINCE 1950

INTRODUCTION

1. This study investigates the trends in educational expenditure during the last 15 years and compares present levels of such expenditure in the different countries. Its objective is to contribute towards devising a financial policy for education with a view to closing one of the main gaps found in educational planning. Until now educational policies have disregarded the financial aspects, apart from drawing up estimates (roughly and very imperfectly) of expenditure based on forecasts of increased numbers of pupils and teachers, and increased equipment and building requirements, with no possibility of controlling costs. The method usually employed is to forecast the student enrolments independently (by extrapolation of past trends, by setting arbitrary targets, or more rarely by translating manpower requirements into training targets) and it is only at a second stage that these numbers are converted into forecasts of expenditure by using unit costs which have been roughly calculated by dividing the present current cost of the main levels and types of education by the corresponding number of pupils. In many cases it has been assumed, explicitly or not, that unit costs would remain constant throughout the period of the forecast; now there is a growing inclination to assume that unit costs will tend to rise (United States, United Kingdom, France, etc.), but, as what makes them rise is not properly known, one resorts to making over-simplified assumptions by extrapolating recent trends (using time series of limited scope and doubtful validity), or by forecasting increases in average staff pay without taking account of structural changes in the teaching body.

2. Under these conditions it is not surprising if the increase in educational expenditure, which, as is well known, has been considerable in the recent past, is being passively borne rather than being checked or planned. At first it was warmly welcomed by all shades of opinion as in line with a highly desirable social objective and with investment required for economic growth; the recommendations of the Conference organised by O.E.C.D. in Washington in 1961 are typical of this state of mind. It now seems that a growing number of countries are worried by the continued rise in educational expenditure to the detriment of other public expenditure and other sectors of the economy and are trying to set limits for it. The desire to spend more on education is giving way to the desire to spend better.

3. This means improving or changing the methods used to work out educational plans and programmes and, in particular, introducing financial considerations into decision-taking: whether one uses techniques such as cost analysis, cost-effectiveness analysis, planning - programming - budgeting system and the other methods which those responsible for educational policy are at present considering, or whether one wants to fix an optimum or a limit for educational expenditure or else to find new sources of finance, one cannot make much progress without a better knowledge of educational expenditure and the factors which determine it.

4. In the present study an attempt has been made to collect and analyse a certain amount of information on this subject and to present the data as far as possible in a form suitable for comparison, bearing in mind existing differences between national systems of public accounting and also between the educational systems themselves. In spite of the difficulties encountered, many of which could not be overcome, the results of the study provide a set of distinctly more homogeneous data than anything available hitherto. This is, above all, due to the valuable help which the Statistical Departments of the Member countries furnished in completing the enquiry questionnaires, in commenting on and often in correcting the data prepared by the Secretariat. It must be added that during the first phase of the study UNESCO very kindly put at our disposal the replies to its annual enquiries on educational expenditure, which enabled us to make a preliminary analysis which was then submitted to national authorities together with the questionnaire drawn up by the Secretariat.

5. The authorities responsible for educational policy, as well as public opinion, are taking a growing interest in international comparisons between educational systems, especially as regards the percentage of national resources (or public expenditure) devoted to education. This attitude reflects a spreading anxiety to define national policies for educational expansion in relation to the enrolment levels attained in the other countries and the educational reforms and developments which are carried out in them. That is why the study has given special attention to measuring trends in educational expenditure, because hardly any investigation of these trends had been made hitherto, even on a national basis.

6. The data collected by means of the enquiry which was made provide a more complete and comparable body of information than the national and international statistics at present available. It was not possible to achieve this result by rearranging already existing data and in most cases the National Statistical Departments had to carry out lengthy research in order to assemble information which had never been collected before.

7. In spite of this, the considerable gaps which the study did not manage to fill must be pointed out at the start, so as to avoid the need to refer to them in every paragraph. Several reasons can be given for them. First, the budgets of the Ministries of Education are the main source of information, whereas a not unimportant part (varying from one country to another) of expenditure is borne by other Ministries or by local communities; moreover, the budgets of the Ministries of Education include, in varying degrees, items of expenditure which do not concern the educational system. Secondly, the private resources for private education (and in some cases, of public education) are little known: expenditure by industries on in-service training, and direct expenditure by families (not to mention indirect expenditure and earnings foregone by students), are very little studied. One might think that an enquiry into the expenditure of educational establishments would permit the uncertainty about sources of finance to be cleared up, but the data covered by the accounts of these establishments are too fragmentary to be very useful.

8. A further difficulty is found in public accounting practice, which has hitherto aimed mainly at checking expenditure in accordance with criteria far removed from those applicable to economic analysis. Insofar as the objective of the enquiry by the Secretariat was to make an analysis which would be of value in framing educational policies, one could not be content with reproducing the financial statistics already available. It is evident that the work of re-examining these data can yield satisfactory results only in the long term, so that the findings of the present enquiry cannot be regarded as more than a first stage.

9. That is why the three tables drawn up by the Secretariat to serve as a basis for the enquiry were reduced, after some preliminary tests, to quite modest proportions: they give a bare minimum of information under such rudimentary overall headings as expenditure on education by the Ministry of Education, by the other Ministries and by the provincial and local authorities (Table I); expenditure from public and private funds on public and private education (Table II); salaries of teaching and non-teaching personnel, subsidies and scholarships, capital expenditure (Table III); total expenditure on higher education at universities and elsewhere.

10. Although the information requested seems elementary, only a few countries were able to fill in these tables completely. It appears that data on educational expenditure are still shown in the accounts under the headings of the different administrative departments concerned(1), and not in a consistent manner enabling

(1) This is especially the case with the educational expenditure of local communities, which the central Government often does not know well; even when one scrutinises the accounts, it is difficult to tell what part government subsidies play, since these are not always allocated specifically to educational activities.

them to be regrouped into meaningful economic categories. Data for expenditure on private education are practically non-existent. Instead, there is some information on government subsidies to private institutions, but the scant particulars given of their own resources boil down to rough and partial estimates based on a priori assumptions and not on enquiries. Some details have been supplied by the National Statistical Departments on various points and appear in the country Annexes, but they are far from giving even an approximate idea of overall expenditure on the educational system. All these gaps in basic information mean that we are still a long way from possessing the material required for forming an overall view of educational expenditure and taking it into consideration in educational policy decision-making.

11. One result of this state of affairs is that there is no functional expenditure breakdown making it possible to analyse expenses for each level and branch of education and for the main goods and services consumed in operating educational establishments. Furthermore, some public expenditure either is not brought to account, or is booked at prices far removed from real costs: cost of land, rents of buildings, retirement pensions, social transfers, etc. So there are at present no means of knowing and analysing "cost prices" in the education sector: thus one lacks indispensable yardsticks for assessing efficiency in the use of resources and a fortiori for improving their use.

12. Just as striking is the discovery that none of the countries examined(1) has yet set up arrangements for tracing the trend of educational expenditure, although its exceptionally rapid growth has been raising new problems, especially in budgeting and forecasting public expenditure. The authorities seem to have confined themselves to recording the year-by-year increase after the event, either in current prices, or in budget percentages, or by adjusting them with the aid of a general price index which takes no account of the very special structure of educational expenditure.

As a rule ignorance prevails regarding non-government sources of finance: it is not known whether family contributions (in the form of school fees or indirect expenditure) are rising or falling; the same is true of industrial expenditure on training. This ignorance can lead to irrational decisions, since none of the decision-makers concerned can plan his actions in the light of overall educational expenditure (which is an unknown factor), but only in the light of that part of it for which he is directly responsible.

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(1) It should be noted, however, that in the United States the Office of Education has been publishing statements of educational expenditure at constant prices since 1952, by making rough adjustments with the help of three price indices.

13. Under these conditions it is not surprising to find that in the rare cases where multi-annual forecasts of educational expenditure have been made, they have been surpassed in reality, because they have consistently underestimated the factors which push up costs. A better knowledge of past trends and of the elements of education cost would no doubt make it possible to narrow this margin of error considerably.

14. Generally speaking, the gaps revealed by the enquiry into family and industrial expenditure on education tend to show that the O.E.C.D. countries have not yet worked out policies for educational financing, in contrast to what is found in the field of occupational training, where a groundwork has been laid in several countries during the period under review.

15. From the results of the enquiry it appears that the possibility of recasting the overall expenditure of the "education sector" within the national accounting system is still remote. An O.E.C.D. publication(1) recommended drawing up five tables detailing the various financing stages and giving a breakdown of expenditure by type and by field of education. Without going as far as this, one can see that the national accounts of Member countries do not even deal with the education sector in a uniform manner. The international nomenclature puts education (public and private) under the heading "health and educational services". But an enquiry(2) which O.E.C.D. made in 18 countries reveals that only one third of them conform to it(3). Five countries(4) classify education with "miscellaneous services". Three others(5) classify public education under "public administration" and expenditure on private education under "health and educational services", while the United Kingdom and the Netherlands put only public education under the latter heading, private education being included under "miscellaneous services".

16. Moreover, one wonders whether the framework of the national accounts, even if revised, would be best suited for dealing with the financial problems of education. None of the service sectors fit well into a system devised primarily for the sectors producing material goods. As is mentioned in a study

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(1) Methods and Statistical Needs for Educational Planning, O.E.C.D., Paris, 1967.

(2) The Growth of Output in O.E.C.D. countries 1960-1980, App. I, CPE/WP2(69)17.

(3) Austria, Greece, Ireland, Norway, Portugal, Sweden.

(4) United States, Canada, Japan, Italy and Luxembourg.

(5) Germany, Spain, France.

of this question which was recently made in the United Kingdom, one would have to exclude strictly from educational expenditure all capital movements and purchases of goods, which are already accounted for in their respective production sectors, and leave nothing debited to the "Education Sector Account" except salaries and pensions. It is not clear how the resulting "value added" concept could lead to a better choice of options in an educational system whose services are available almost gratis to the public, or to a better knowledge of it. It would be more interesting to analyse the monetary and other transfers which education brings about between the different social classes, since one of the purposes of the educational system is to reduce class inequalities, and since the provision of education almost free of charge makes it difficult to identify who finances, and who benefits from, the educational services available to the population as a whole. It is obviously not possible to base a study of these questions on an enquiry voluntarily limited to a small amount of general information. The object of the exercise has been to facilitate the task of the National Statistical Departments and obtain replies which can be compared between one country and another, despite the considerable differences in public accounting practice and responsibility for financing, and between the educational systems themselves.

17. It was necessary to point out the gaps which the enquiry has been unable to fill, the inadequacy of the overall financial data and the limitations of international comparisons. But subject to these reservations, information and assessments of interest for educational policies can be derived from the data which have been assembled.

We shall consider in turn the findings concerning the trend of educational expenditure in each of the countries under review, the levels of educational expenditure in all O.E.C.D. countries, and future prospects.

CHAPTER I

TRENDS IN EDUCATIONAL EXPENDITURE DURING THE LAST 15 YEARS

18. Data on total educational expenditure are available for only 10 countries out of 23. Moreover, it should be noted that for several of them the information is incomplete and that two countries (Yugoslavia and Iceland) have stated that they have only public expenditure. That is why the analysis concentrates on the trend of public expenditure, since a minimum of data for each of the 23 countries studied was available(1). By collating the two series (for the countries for which both are available) one sees, moreover, that the trends have been almost parallel, which leads one to suppose that the figures for public expenditure are a good rough guide to increases in total educational expenditure.

19. To measure how much educational expenditure had grown, it was first necessary to express it in constant prices. As a first step, the procedure usually adopted by statistical departments for adjusting prices in the public services was followed, namely, deflating salaries with the help of a cost-of-living index. For capital expenditure an index of building prices was used. A study of the figures so obtained for each available year (in general 1950 to 1966) reveals exponential growth rates of great regularity, so that growth could be expressed in average annual rates (geometrical); these were obtained by the least-square method which has the advantage of taking account of all the data in each series and not just of the two extreme years. In some cases the study of the graphs showed that growth had been irregular (Austria, Turkey, Yugoslavia), so different growth rates were calculated for several distinct periods.

20. The results are given in Table I (page 8), which shows growth rates for public educational expenditure (distinguishing between current costs and investments) and total educational expenditure (with the same distinction). The figures confirm that growth in educational expenditure was considerable in almost all O.E.C.D. countries: rates exceeded 10 per cent a year in half the countries studied; only four countries had rates below 7 per cent.

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(1) For two countries (Greece and Italy) the only information which could be used was what they supplied in reply to the annual questionnaires from UNESCO.

TABLE I

Trends in educational expenditure as shown by average annual growth rates

Assumption B: Deflation of current expenditure with a cost-of-living index

Country	Period	Total public expenditure	Current public expenditure	Total expenditure (current and capital)	Total expenditure (current only)	Forecasts 1957-1970 of the Washington Conference: Minimum hypothesis	Forecasts 1957-1970 of the Washington Conference: Maximum hypothesis
Germany	1950-1966	9.3	8.9			5.11	6.83
Austria	1950-1954	12.0	11.6				
	1955-1967	7.9	9.1			2.96	4.62
Belgium	1958-1967	8.6	9.2			3.4	5.05
Canada	1954-1965	13.5(*)	11.2(*)	13.5	12.3	5.74	6.85
Denmark	1955-1966	11.4	11.7			3.73	5.30
Spain	1950-1968	12.8	10.3			6.03	9.24
United States	1955-1967	8.2(*)	8.8(*)	8.5	9.1	4.48	5.55
Finland	1950-1967	7.5	8.3	7.9	8.7		
France	1952-1967	11.0	10.7			5.44	7.00
Greece	1950-1966		12.2			4.00	5.46
Ireland	1950-1965	5.7	4.4			1.7	2.8
Iceland	1950-1967	12.5	10.8				
Italy	1950-1965	13.2	12.1			5.9	7.3
Japan	1950-1965	10.2	9.7			4.6	5.8
Luxembourg							
Norway	1950-1967	7.4	8.5	7.1	8.3	3.7	5.22
Netherlands	1950-1968	11.4	11.5	10.6	10.6	3.38	5.13
Portugal	1950-1965	6.5	5.9			3.27	5.36
United Kingdom (England and Wales)	1950-1966	6.8	6.6			3.66	4.28
Sweden	1962-1966	11.4	10.8			2.65	4.80
Switzerland	1955-1964	7.9	7.5			3.32	5.10
Turkey	1950-1960	5.4	7.8(a)	6.6	7.9(1)	6.95	8.85
	1960-1967	11.6		11.5			
Yugoslavia	1952-1967	17.5	17.9			7.8	10.4

(*) Total expenditure for public education.

(a) Period 1950-1967.

TABLE II

Trends in educational expenditure as shown by average annual growth rates

Assumption A: Deflation of current expenditure with a salary index

Country	Period	Total public expenditure	Current public expenditure	Total expenditure (current and capital)	Total expenditure (current only)	Assumption A' (deflation of salaries with a salary index)	
						Total public expenditure	Current public expenditure
Germany	1950-1966	5.9	4.4			6.8	5.7
Austria	1950-1954	9.3	9.6				
	1955-1967	5.4	3.1				
Belgium	1958-1967	4.3	4.1				
Canada	1954-1965	11.7(*)	10.0(*)	12.3	10.7		
Denmark	1955-1966	7.3	6.8				
United States	1955-1967	6.8(*)	7.0(*)	7.0	7.2		
Finland	1950-1967	5.7	6.1	6.2	6.5	6.6	7.2
France	1952-1967	7.6	6.8				
Ireland	1950-1965	3.6	1.9				
Italy	1950-1965	10.8	9.4				
Japan	1950-1965	7.4	6.0			8.2	7.0
Norway	1950-1967	5.0	5.3	4.8	5.1	5.8	6.4
Netherlands	1950-1968	7.8	7.1	7.7	6.2		
Sweden	1962-1966	8.8	7.3				
Switzerland	1955-1964	6.3	5.8				
Yugoslavia	1952-1967	13.3	13.0				

(*) Total expenditure for public education.

21. This development easily surpassed the forecasts made at the Washington Conference in 1961. For purposes of comparison the average annual growth rates for current expenditure on education 1957-1970 were calculated, in line with the minimum and maximum hypotheses of the Washington Conference Report. In the preparatory working documents written in 1960, expenditure forecasts had been worked out on two assumptions (lower and higher) as to the enrolment rate for all educational levels, and on the basis of costs per pupil linked to the respective national levels of teachers' salaries. Thus one can arrive at a forecast of the trend of educational expenditure in each country and compare it with the trend actually followed since 1957, which was used as a base year for the forecasts. The growth rates corresponding to these forecasts are given in the last two columns of Table I.

It will be seen that the highest assumed level has been exceeded by all countries. It should be pointed out that the objectives of the Washington Conference had been formulated in terms of enrolment targets, i.e. the volume of educational services.

In translating these educational objectives into expenditure forecasts, the authors of the report assumed that staff salaries would not increase at a faster rate than income per head, and that prices of goods purchased would rise similarly. To the extent that the forecasts of numbers of pupils were nearer to reality than the financial forecasts, it seems that the factors pushing up expenditure were badly underestimated. This should be borne in mind for the future, especially as the same error has crept into expenditure forecasts made at national level.

22. It is possible to use another method to express expenditure on personnel in constant prices: it consists of using a salary index instead of a cost-of-living index or any other general price index. One can then follow developments in the volume of educational services uninfluenced by variations in teachers' purchasing power, assuming that the quality of their services had not varied.

Table II shows growth rates of educational expenditure calculated with a salary index.

This method of calculation has been designated "assumption A" to distinguish the rates obtained by it from those obtained by the first method, called "assumption B". In some cases the salary index has been applied to expenditure on personnel alone, and this rather more accurate calculation has been called "assumption A'".

23. In the absence of statistics for trends in teachers' pay, a general salary index has been used, involving the risk of distorting the figures insofar as salaries in teaching may have followed a different trend from that of salaries as a whole, But the relative variations are probably of little importance in the long term.

24. The growth rates in Table I are strikingly different from those in Table II, which shows that the results are highly sensitive to the method of calculation used. Such divergencies, which are of the order of at least 20 per cent (United States) and reach 100 per cent (Germany), merit close scrutiny. It will be seen that in ssumption A', which is less inaccurate than assumption A, the rates are somewhat closer to those in assumption B. But even when corrected in this way the differences remain too great to be merely recorded without comment. As will be seen further on, the choice between the two methods depends on an assessment of trends of productivity in the educational sector. The two assumptions A and B correspond to the two extreme assumptions that can be made in this respect, depending on whether one considers that teacher productivity has not risen (assumption A, or better assumption A'), or that it has risen as fast as in the other sectors of the economy (assumption B).

25. When one studies the data on capital expenditure, one finds that big developments have also taken place in school equipment during the period under review; the trend of investment expenditure is not as regular as that of current expenditure, which makes the calculation of its annual growth rate less important but it is seen to grow faster than current expenditure in the majority of countries.

26. One also finds that it is in higher education, university and non-university, that the increase in expenditure has been by far the greatest. As will be seen from Table III, the growth rates exceed 12 per cent a year in three-quarters of the countries and are over 14 per cent in five of them.

27. It may be thought that the growth of educational expenditure is linked with the growth of the economy on the one hand and the growth of public expenditure on the other. To measure this relationship, regression equations were worked out for these variables for each country. As the logarithms of the variables were used for making the adjustments, the regression coefficients are also elasticity coefficients, which makes it easier to interpret them.

28. Table IV gives the equations which result from expressing growth of educational expenditure as a function of growth of national product. For educational expenditure the constant price series have been taken, using assumptions A and B alternately; for the national product, constant price series have been taken from the national accounts.

29. The first point of interest is that the relationship between the two series of variables is very close, the correlation coefficients being above 0.95 for 35 equations out of 39; only one coefficient is below 0.9. Very great significance

TABLE III

Trends in expenditure on higher education

(annual average growth rates)

Country	Period	Assumption B		Assumption A	
		Total expenditure	Current expenditure	Total expenditure	Current expenditure
Germany	1957-1966	17.1	16.3	13.9	11.4
Belgium	1958-1967	12.5	13.3	9.1	12.7
Canada(*)	1954-1965	19.6	16.6	18.2	14.6
Denmark	1955-1966	25.0	22.0	20.5	16.7
Spain	1950-1968	12.4	11.4		
United States	1955-1967	11.7	11.4	10.2	9.6
Finland	1950-1967	12.5	11.1	10.7	8.9
France	1958-1968	14.9	13.3	12.4	9.2
Ireland	1951-1963	8.9		6.9	
Iceland	1950-1957		2.4		
	1957-1967		16.0		
Italy	1950-1965		15.0		12.2
Japan	1950-1965	12.5	11.1	9.9	7.3
Norway	1950-1967	9.8	10.0	7.7	6.9
Netherlands	1950-1968	18.0	16.8	14.5	11.6
United Kingdom (England and Wales)	1950-1966	11.4	9.8	10.2	8.5
Turkey	1950-1967	7.2	5.0		
Yugoslavia	1952-1967		18.2		

(*) Universities only.

N.B. Unless stated differently expenditure on all types of education has been taken into account: higher, university and non-university.

may thus be attached to the elasticities shown, (and the standard deviations) show that the confidence limits are very satisfactory. With the series in assumption B, 18 elasticity coefficients (out of 21) are found to be above 1.5, among which 12 are above 2, which means that educational expenditure is rising more than twice as fast as the national product. With the data in assumption A the elasticities are distinctly less, which is to be expected, since the growth of educational expenditure is much less when calculated in this way. But even so, eight elasticities out of 18 are found to be above 1.5; only three are below unity.

The results are much the same, moreover, if one takes total expenditure and public expenditure for a given country, and the situation is the same when one takes national income instead of gross national product.

30. So these calculations lead to the conclusion that the growth of educational expenditure is "explained" (in the statistical sense of the word) very fully by economic development, for all the countries and for the whole of the period under review. This being so, it seems possible to use this relationship, which is found to hold good for the last 15 years, as a means of forecasting future developments. This question will be taken up again in Chapter III.

31. Similar calculations have been made for each country by relating the current public educational expenditure to all current public expenditure for all the available years. As regards this second variable, the concept of "public expenditure on goods and services" has been used, which excludes transfer operations and is thus more comparable with public expenditure on education, which consists essentially in purchases of goods and services, with the exception of relatively trivial amounts allocated to scholarships and transfers of a social nature.

32. The corresponding equations are given in Table V. The results are very comparable with those already shown in connection with national product: the correlation coefficients are very high (26 out of 33 are above 0.95). In assumption B, 13 elasticity coefficients (out of a total of 16) are above 1.5 and nine are above 2. Assumption A leads, as it did before, to lower elasticity coefficients, these being below 1 in three cases out of 17 and above 1.5 in six cases only. Lower values, on the whole, are to be expected than in the previous set of equations, as public expenditure has risen faster than national income in the majority of O.E.C.D. countries.

33. After collating the results in Tables IV and V, one can conclude from the experience of the last 15 years that the trend of educational expenditure can be "explained" just as satisfactorily by the trend of public expenditure as by that of

Table IV

Time elasticities

Trends in educational expenditure as a function of G.N.P.
(at constant prices - base year 1957)

Country	Period	Number of years taken into account	Equations	Correlation coefficient R
Germany	1950-1966	16	Assumption A : log EP = 0.885 log PNBm - 1.36 (0.031)	0.99
	"		" A' : log EP = 1.024 log PNBm - 1.68 (0.036)	0.99
	"		" B : log EP = 1.38 log PNBm - 2.54 (0.037)	0.99
Austria	1950-1954	5	Assumption A : log EP = 1.7002 log PNBm - 5.2684 (0.503)	0.911
	"		" B : log EP = 2.1361 log PNBm - 7.4981 (0.523)	0.935
	1955-1967	13	Assumption A : log EP = 1.1554 log PNBm - 2.3771 (0.116)	0.950
	"		" B : log EP = 1.9282 log PNBm - 6.3248 (0.136)	0.974
Belgium	1958-1967	10	Assumption A : log EP = 0.852 log PNBm - 0.533 (0.170)	0.870
	"		" B log EP = 1.743 log PNBm - 5.634 (0.145)	0.973
Canada	1954-55/1965-66	12	Assumption A : log EEP = 2.551 log PNBm - 13.133 (0.179)	0.976
	"		" B : log EEP = 2.917 log PNBm - 15.889 (0.196)	0.978
Denmark	1955-1966	12	Assumption A : log EP = 1.4298 log PNBm - 3.3889 (0.073)	0.985
	"		" B : log EP = 2.2138 log PNBm - 6.9417 (0.064)	0.99
Spain	1950-1968	10	Assumption A : log EP = 1.818 log RN - 6.501 (0.068)	0.99
	1960-1968	5	" B : log EP = 2.571 log RN - 10.773 (0.294)	0.98
United States	1955-56/1967-68	13	Assumption A : log EEP = 1.6552 log PNBm - 5.1225 (0.068)	0.991
	"		" B : log EEP = 1.9759 log PNBm - 6.9352 (0.095)	0.987
France	1952-1967	16	Assumption A : log EP = 1.4685 log PNBm - 4.0015 (0.064)	0.987
	"		" B : log EP = 2.0828 log PNBm - 7.299 (0.070)	0.992
Ireland	1950-1965	11	Assumption A : log EP = 1.7317 log PNBm - 5.7428 (0.16)	0.964
	"		" B : log EP = 2.6026 log PNBm - 10.75 (0.157)	0.984
Iceland	1950-1967	17	Assumption B : log EP = 2.283 log PNBm - 6.30 (0.109)	0.983
Italy	1950-1965	12	Assumption A : log EP = 1.6673 log PNBm - 6.3023 (0.059)	0.994
	"		" B : log EP = 2.0008 log PNBm - 8.7141 (0.055)	0.996
Japan	1953-1965	13	Assumption A : log EP = 0.79 log PNBm - 0.52 (0.045)	0.982
	"		" B : log EP = 1.01 log PNBm - 1.42 (0.037)	0.992
Norway	1950-1967	18	Assumption A : log EP = 1.300 log PNBm - 2.779 (0.049)	0.988
	"		" B : log EP = 1.848 log PNBm - 5.237 (0.078)	0.985
Netherlands	1950-1967	18	Assumption A : log EP = 1.5938 log PNBm - 4.10 (0.052)	0.991
	"		" B : log EP = 2.3049 log PNBm - 7.3289 (0.037)	0.998
Portugal	1950-1965	16	Assumption B : log EP = 1.1870 log PNBm - 2.7127 (0.120)	0.935
United Kingdom	1953-1965	13	Assumption A : log EP = 2.06 log PNBm - 6.14 (0.095)	0.988
	"		" B : log EP = 2.47 log PNBm - 7.91 (0.112)	0.988
Sweden	1954-1965	9	Assumption A : log EP = 1.4482 log PNBm - 3.4683 (0.089)	0.987
	"		" B : log EP = 2.0522 log PNBm - 6.3275 (0.103)	0.991
Switzerland	1955-1964	10	Assumption A : log EP = 1.2681 log PNBm - 2.6914 (0.117)	0.966
	"		" B : log EP = 1.5551 log PNBm - 3.9763 (0.125)	0.975
Turkey	1950-1967	18	Assumption B : log EP = 1.842 log PNBm - 5.120 (0.15)	0.95
Yugoslavia	1952-1967	16	Assumption B : log EP = 1.97 log PNB - 5.72 (0.127)	0.972

N.B. Standard deviations have been indicated in brackets under the elasticity coefficients to which they refer.

the national product. It would seem that one or other of these relationships could be used as a forecasting instrument, at least insofar as the present situation will remain substantially unchanged. The developments they cover are so closely linked together that one even wonders what margin of choice is left for fixing expenditure on education which seems to a large extent to elude control by government authorities.

34. The percentage of the national product (or of public expenditure) devoted to education is often used as an indicator of the overall effort made by the community in favour of the educational system. It has the advantage of being easy to calculate and it appears easy to interpret. Table VI shows public expenditure on education (current and capital) in 23 countries, expressed as a percentage of gross national product at market prices for the years 1950, 1955, 1960, 1965 and 1967. Table VII gives, for 13 countries only, total expenditure on education expressed as a percentage of G.N.P. (at market prices). The comparability of the data in the latter table is much more questionable than in the previous table; the methods used to estimate educational expenditure other than public vary from one country to another and appear in all cases to omit an important part of expenditure on private education, as well as family and industry contributions.

In both tables one notices how fast these percentages have risen for each country from one period to the next. But this discovery is only of limited relevance; the percentages convey less accurate information than the indices in the preceding tables. The variable is a complex one and fluctuates under the influence of changes both in the numerator and in the denominator, whereas the direct calculation of growth rates in Tables I, II and III enables trends in educational expenditure to be identified, and the elasticities in Tables IV and V compare the two trends instead of confusing them. Moreover, price trends in the education sector are different from those in the economy as a whole, and this can be taken into account in calculating the elasticities. A striking example of divergence between these trends is given in a detailed study of educational expenditure in Germany(1), which shows that the share of educational expenditure in the national product increased between 1950 and 1962 when expressed in current prices, but declined when the two series are calculated at constant prices.

35. One can compare the increase in these percentages in all the countries during the period under review with the accompanying decline in the share of military expenditure.

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(1) G. Palm, "Die Kaufkraft der Bildungsausgaben", Olten, Freiburg, 1966.

TABLE V

Time elasticities

Trends in educational expenditure as a function of public expenditure
(at constant prices - base year 1957)

Country	Period	Number of years taken into account	Equations	Correlation coefficient R
Germany	1950-1966	16	Assumption A : log EPc = 0.71 log DPbs - 0.47 (0.059)	0.95
	"		" A': log EPc = 0.93 log DPbs - 0.80 (0.061)	0.97
	"		" B : log EPc = 1.44 log DPbs - 1.59 (0.083)	0.98
Austria	1955-1967	13	Assumption A : log EPc = 0.995 log DPbs - 0.744 (0.087)	0.96
	"		" B : log EPc = 2.417 log DPbs - 6.764 (0.160)	0.98
Belgium	1958-1967	9	Assumption A : log EPc = 1.297 log DPbs - 0.722 (0.111)	0.906
	"		" B : log EPc = 1.396 log DPbs - 2.425 (0.095)	0.984
Canada	1954-55/1965-66	12	Assumption A : log EEpc = 3.7278 log DPbs - 18.8916 (0.280)	0.973
	"		" B : log EEpc = 4.5180 log DPbs - 24.1635 (0.345)	0.972
Denmark	1955-1966	12	Assumption A : log EPc = 1.373 log DPbs - 2.0167 (0.0477)	0.994
	"		" B : log EPc = 2.3387 log DPbs - 5.524 (0.079)	0.994
United States	1955-56/1966-67	12	Assumption A : log EEpc = 1.9226 log DPbs - 5.3023 (0.135)	0.976
	"		" B : log EEpc = 2.4339 log DPbs - 7.8087 (0.185)	0.972
France	1952-1967	15	Assumption A : log EPc = 2.1674 log DPbs - 5.9576 (0.239)	0.929
	"		" B : log EPc = 3.3584 log DPbs - 11.3129 (0.356)	0.934
Ireland	1950-1965	16	Assumption A : log EPc = 1.3236 log DPbs - 2.2208 (0.193)	0.880
	"		" B : log EPc = 2.7279 log DPbs - 8.992 (0.436)	0.858
Iceland	1950-1967	18	Assumption B : log EPc = 1.703 log DPbs - 2.450 (0.037)	0.996
Italy	1950-1965	12	Assumption A : log EPc = 1.7746 log DPbs - 5.5126 (0.146)	0.967
	"		" B : log EPc = 2.2627 log DPbs - 8.5922 (0.155)	0.977
Japan	1955-1965	13	Assumption A : log EPc = 1.05 log DPbs - 0.61 (0.058)	0.983
	"		" B : log EPc = 1.57 log DPbs - 2.18 (0.101)	0.978
Norway	1950-1967	17	Assumption A : log EPc = 1.044 log DPbs - 0.853 (0.071)	0.966
	"		" B : log EPc = 1.644 log DPbs - 3.007 (0.109)	0.968
Netherlands	1950-1967	18	Assumption A : log EPc = 2.0270 log DPbs - 4.4518 (0.127)	0.970
	"		" B : log EPc = 3.1853 log DPbs - 8.7384 (0.216)	0.965
Portugal	1950-1965	16	Assumption B : log EPc = 0.9135 log DPbs - 0.6139 (0.071)	0.960
United Kingdom	1953-1965	13	Assumption A : log EPc = 3.29 log DPbs - 8.99 (0.967)	0.717
	"		" B : log EPc = 3.79 log DPbs - 10.78 (1.30)	0.661
Sweden	1954-1965	9	Assumption A : log EPc = 1.1297 log DPbs - 1.1836	0.981
	"		" B : log EPc = 1.8412 log DPbs - 4.0122 (0.138)	0.981
Switzerland	1954-1965	12	Assumption A : log EPc = 1.1479 log DPbs - 1.1474 (0.092)	0.969
	"		" B : log EPc = 1.5071 log DPbs - 2.4079 (0.109)	0.974

N.B. Standard deviations have been indicated in brackets under the elasticity coefficients to which they refer.

TABLE VI

Public expenditure on education

in percentages of G.N.P. (at market prices)

Country	1950	1955	1960	1965	1967 or last available year
Germany	1.97	2.19	2.33(g)	2.91	2.96(e)
Austria	1.42	2.61	2.88	3.60	4.40
Belgium		3.25	4.77	5.13	5.57
Canada		2.67	4.06	5.65	
Denmark		3.27	3.98	5.47	6.12
Spain		1.00	1.22	1.30	2.14(f)
United States		3.26	4.01(g)	4.87	5.10
Finland	4.10	4.32	4.60	5.43	6.43
France		2.83	3.57	4.56	4.81
Greece		1.51	1.60	1.88(d)	
Ireland		3.02(a)	2.98	4.04	4.23
Iceland	2.78	2.38	3.28	3.86	4.80
Italy	2.26		4.21(b)	5.18	
Japan	4.05	4.52	4.01	4.54	
Luxembourg		2.74	3.43	4.34	
Norway	2.79	3.41	4.38	5.36	5.81
Netherlands	2.66	3.57	4.57	6.16	6.71
Portugal	1.36	1.58	1.83	1.44	
United Kingdom		2.68	3.41	4.15	
Sweden			5.85(c)	6.80	7.40(e)
Switzerland		3.09	3.25	3.62(d)	
Turkey	2.24	2.17	2.42	3.75	3.70
Yugoslavia		2.23	3.33	4.34	4.59

(a) 1956. (b) 1961. (c) 1962. (d) 1964. (e) 1966. (f) 1968.

(g) Interpolation between 1959 and 1961.

TABLE VII

Total educational expenditure

in percentages of G.N.P. (at market prices)

Country	1950	1955	1960	1965	1967 or last available year
Germany	2.16	2.33	2.43(g)	3.00	3.05(e)
Canada		2.98	4.57	6.42	
Spain			2.18	2.21(h)	3.03
United States		4.21	5.34(g)	6.53	6.79
Finland	4.29	4.54	4.88	5.78	7.76
France(j)		2.89	3.63	4.63	4.89
Greece	1.21	1.52	1.98	2.09	2.04(e)
Iceland(i)	2.78	2.38	3.28	3.86	4.80
Japan	4.65	5.31	4.91	5.86	
Norway	2.98	3.57	4.55	5.55	5.99
Netherlands	2.77	3.89	4.86	6.39	6.93
Turkey	2.37	2.32	2.60	4.01	3.92
Yugoslavia(i)		2.23	3.33	4.34	4.59

(e) 1966.

(g) Interpolation between 1959 and 1961.

(h) Interpolation between 1964 and 1966.

(i) The available sources of information show that total expenditure is the same as public expenditure.

(j) Disregarding family expenditure.

Table VIII compares the percentage of public expenditure devoted to education in 1957 and 1966 with the percentage of military expenditure for the same years. With the exception of two countries, the share of military expenditure has declined considerably, whereas the share of educational expenditure shows an increase of almost the same order. It can be argued that the disproportionate growth of educational expenditure in recent years has been partly at the expense of the reduction in the rate of growth of military expenditure.

GROWTH FACTORS IN EXPENDITURE

36. Measuring expenditure trends is not an end in itself. If an analysis of overall expenditure is to be of help in framing educational policy, it must illuminate those growth factors on which forecasts and action can be based. The main factors are easy to identify. They are essentially the rise in prices, demographic growth, the rise in the enrolment rate, the improvement (or deterioration) in the staffing ratio, and the rise in teachers' salaries, which is itself the result of several structural factors.

37. Demographic growth is far from being the main factor responsible for increasing expenditure. Of course it made a certain contribution, since the numerically superior generations born after the war received their schooling during this period. One cannot generalise, as birth rate trends vary with the country and the year. But in each of the countries the rise in the number of enrolments has been much faster than that of the relevant generations.

In addition to this continuous rise in enrolment rates for each age group comes the incidence of the increase in unit costs. The latter is partly due to the improvement in staffing ratios which is found in almost all the countries and at all levels of education (except in certain fields of secondary education at certain periods); indeed it is remarkable how, during this period of accelerated growth, the number of teachers increased even faster than the number of pupils. But the effect of this reduction in the number of pupils per teacher was far less important than the increase in teachers' salaries.

38. When one examines the development of teachers' average salaries, one finds that they rise much faster than the cost-of-living, contrary to the opinion one often hears; the gap between the two varies from one country to another and reflects to a large extent the general increase in purchasing power found in all O.E.C.D. countries. The data available are insufficient for carrying the analysis further and studying the development of teachers' pay as compared with that of other salaries. Even when it is established that teachers' <u>average salaries</u> go up faster than other salaries, as seems most often to be the case, the various factors responsible for this still remain to be analysed.

TABLE VIII

Trends in educational expenditure and military expenditure between 1957 and 1966

(in percentages of public expenditure)

Country	Period	1957		1966	
		EP / DP	DM / DP	EP / DP	DM / DP
Germany	1957 & 1966	15.8	17.6	17.4	22.0
Austria	"	18.2	8.6	25.3	8.3
Belgium	1958 & 1966	13.4	24.7	34.5	17.8
Canada	1957 & 1965	20.6	38.5	36.6	21.0
Denmark	"	17.2	20.8	34.5	16.8
United States	1957 & 1966	17.5	48.5	21.9	37.7
France	"	18.1	39.0	33.0	29.0
Greece	1957 & 1965	11.5	42.1	16.6	32.1
Italy	1957 & 1966	22.7	19.7	30.2	15.6
Norway	"	27.0	26.0	33.8	20.5
Netherlands	"	22.8	29.1	33.4	18.5
Portugal	1957 & 1965	13.8	28.7	11.0	51.3
United Kingdom	"	17.8	40.7	23.5	32.5
Sweden	1958 & 1965	25.0	26.0	31.8	21.3

Source: "National Accounts of O.E.C.D. countries" for public expenditure and military expenditure.

The data on educational expenditure have been collected in the framework of the present study.

N.B. Abbreviations:

EP: Public educational expenditure, current and capital.
DP: Public expenditure, including here current public expenditure on goods and services, plus gross fixed asset formation of public administrations.
DM: Military expenditure.

39. The relative changes which have occurred between the different levels of education during the period under review must first be considered. In countries where it was possible to group teachers according to levels (United States, France, etc.) it is found that the development of average salaries varies from one period to another and from one level to another. In addition there are many categories of teachers within each level and account must be taken of changes in the pattern of their distribution. Certain countries (United States), have been able to raise appreciably the standard of their teachers' qualifications (at the elementary and secondary levels), while at the same time coping with a phase of rapid increase in enrolment numbers; in other countries (France), on the other hand, it was possible to meet the need for intensive recruitment only at the expense of raising the proportion of unqualified teachers or by promoting teachers wholesale from lower levels. As regards higher education, it seems that the proportion of titular professors, or of teachers holding a Doctorate, has everywhere declined. To measure the effects of these changes on the structure of the teaching body one would need accurate data for the numbers in each category and their respective salaries (medians or, if not available, averages), such as do not seem to be assembled systematically by national statistical departments, even for public education.

40. A simplified method for measuring the trend of salaries in the teaching profession is to follow in each of the main fields of study the trend of pay for a fixed category, for example, the salary index for a married teacher with two children at mid-way in his career. Account should next be taken of changes in age structure, since teachers' salaries are, as a rule, closely linked to seniority. Changes in the breakdown by sex must also have a certain effect, insofar as women's salaries are often (de jure or de facto) below those of male teachers.

41. It proved possible to carry out these analyses for some countries, more particularly in the case studies given in the Annex; but they contain too many gaps and inaccuracies for reliable conclusions to be drawn from them. It would seem, however, that the oft-repeated claim that teachers' pay has dropped continuously compared to pay in other professions is not supported by the partial results obtained, which in many instances show a relative improvement; the latter is perhaps due to the state of the labour market, where demand for teachers has been stronger than for many other professions; but perhaps it is also a case of "taking up the slack" after lagging behind, considering that, as between people holding equivalent degrees, teachers' salaries are even now lower than those in most other professions. It seems likely that the upward thrust of the level of salaries as a whole is a more important influence on the

trend of teachers' salaries than fluctuations of supply and demand on the labour market, especially as specific shortages in certain categories of teachers (science or mathematics teachers, for example) are hardly ever reflected by differential pay rates, owing to the attitude of the trade union organisations and the professional code of the teaching body. These assumptions would have to be thoroughly checked by research at national level, and this would be the more necessary since salaries in the education sector are a large and ever-growing proportion of the total salary bill. In several countries today the Ministries of Education are the employers of more than half the civil servants.

42. The case studies on the United States, France, Norway, the Netherlands and the United Kingdom contain a brief analysis of the overall data available. Several methods of calculation are used in analysing the factors of change; they lead to distinctly different results. Apparently the simplest method is to express the changes observed in average annual growth rates, which is admissible in all cases where the movements are exponential and regular. The rates so obtained can be added together and the residues are unimportant. One can then allocate the growth between the various factors identified, the number of the latter depending on the detail in the data available.

In most of the results recorded in the above-mentioned case studies the main contribution to the growth of expenditure comes from the rise in unit costs. Seeing that the share of expenditure on personnel usually remains steady, as does the share taken by the teaching staff, one proceeds to investigate the factors which raise the average salaries of teachers. The case studies by Professor Bicher on France and by M.V. Grant on the United States provide some relevant material in connection with changes in the standards of teachers' qualifications. It is apparently in this field that more widespread and thorough research needs to be done to get to know the price-determining mechanism better.

43. It would be interesting to study salary trends in relation to other current expenditure on education. In some countries (United Kingdom, Norway) the relative share of teachers' salaries is found to have declined somewhat, which would point to a modification of the cost structure due to changes in teaching techniques. One might also suppose that the continuous increase in salaries would prompt government authorities to replace teachers by teaching equipment, the cost of which rises more slowly, and so to encourage the use of a less labour-intensive technology(1).

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(1) In the case study on Norway an attempt was made to calculate this substitution elasticity.

But the main body of data in the study does not seem to support this assumption; on the contrary the results for most countries show a stable distribution of expenditure between the three categories used in the enquiry; personnel, other current expenditure, and student grants. When variations are found between one year and another, they are in most instances fluctuations which seem to be due rather to changes in classification or to fortuitous events unconnected with movements in cost structure.

44. When analysing educational expenditure at this global level one has to admit that there is little hope of getting to the bottom of the question of the trend of cost prices in the education sector. When time series are available for the distribution of items of expenditure between the different levels, one again finds an absence of clearly defined trends, which seems to reflect rigidity in the cost structure; the innovations of recent years as regards teaching techniques do not yet seem to have made changes in the school system extending to the field of finance. It would be valuable if we could verify this assumption by having more detailed studies made at national level, which could be made use of in planning and forecasting. To draw up a cost policy for education one must first assemble much more accurate information covering a wider field than what we have at present; moreover, one would have to elaborate the unit costs, which are given as national averages (found by dividing expenditure by enrolments), by making cost-price studies at the level of educational establishments. An analysis of the points of difference between the costs of one establishment and another would no doubt reveal the principles of efficient management and enable costs to be compared with the effectiveness of the educational system which cannot be done when costs are worked out at national level from partial data in public accounts.

45. This efficiency yardstick is indispensable for educational policy and for correctly estimating educational expenditure. The customary way of measuring the trend of educational expenditure is to express teachers' salaries in constant prices with the help of a cost-of-living index (or sometimes, as in France, of a general price index). This procedure, which measures the trend of teachers' purchasing power, amounts to assuming that their productivity rises in the same way as for the active population as a whole. It would be desirable to check this assumption, but there is no single standard for assessing the results achieved in terms of the manifold objectives of the educational system (individual, social, economic, etc.). Indeed the problem of evaluating teaching services arises for all service activities where there are no physical units to refer to, such as there are in the production sectors.

46. In an attempt to assess the magnitude of this factor indirectly, we have employed two deflationary techniques concurrently, one of which assumes that teacher productivity has followed the general trend (assumption B), while the other assumes that it has not increased (assumption A). To make a more exact calculation one would need to have a teachers' salary index for expressing their salaries in constant prices; any increases in the expenditure figures would then be due to greater numbers of teachers and to structural changes within the teaching body: redistribution between the various levels, different standards of qualification, or changed distribution by age or sex.

However, the two simplified methods used in the study suffice to set the limits (upper and lower) between which the growth rate of educational expenditure would be found to lie if teacher productivity could be measured correctly.

47. Despite the considerable margin of uncertainty in the estimates in Tables I and II, it can nevertheless be stated that the rise in educational expenditure tends to be greater than in educational services to the extent that productivity increases are slower than in the other sectors of the economy. We saw earlier how important this point is in working out the real trend of expenditure, and it highlights the over-riding need to measure academic attainments in order to be able to assess the past or future trend of educational expenditure in terms of cost prices. It is the failure to give due weight to this aspect of the problems of deflation, by confusing the cost of educational services with their productivity, which has constantly led to underestimating the real increase in educational expenditure in the multi-annual forecasts which have been made until now. The rise in costs per pupil has turned out to be faster than expected, and faster than the rise in prices as a whole.

48. Of course the possibility cannot be excluded that teaching services have improved in quality, as this would not be brought to light by either of the two methods of deflation employed which measure only the resources used and not the results obtained; but enquiries made in Great Britain into this question(1) using several performance criteria (increase in enrolment rates in the older age-groups, success rates in secondary school final examinations, etc.), suggest that productivity tends to decline, both in secondary education and in the universities.

49. It appears, then, that a financial policy for education must ultimately be based on a quantitative and qualitative assessment of school output as well as of the wider issue of the effectiveness of the educational system.

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(1) M. Woodhall and M. Blaug: "Productivity Trends in British Secondary Education, 1950-1963", in Sociology of Education, Summer 1968.

M. Woodhall and M. Blaug: "Productivity Trends in British University Education, 1938-1962", in Minerva, Summer 1965.

TABLE IX

Comparison between public expenditure on education in O.E.C.D. countries and G.N.P. per capita and public expenditure per capita (cross-section elasticities)

Year	Number of countries	Equations	Correlation coefficient R
1965	18	$\log \frac{EP}{P} = 1.587 \log \frac{PNB}{P} - 3.24$	0.955
"	15	$\log \frac{EP}{P} = 1.15 \log \frac{PNB}{P} - 7.82$	0.897
"	15	$\log \frac{EPc}{P} = 1.152 \log \frac{DPbs}{P} - 0.968$	0.917
"	14	$\log \frac{EPc}{P} = 0.828 \log \frac{DPc}{P} - 0.4$	0.809
1960	19	$\log \frac{EP}{P} = 1.32 \log \frac{PNBf}{P} - 2.41$	0.943
"	17	$\log \frac{EPc}{P} = 1.37 \log \frac{PNBf}{P} - 2.65$	0.955
"	16	$\log \frac{EP}{P} = 0.92 \log \frac{DPc}{P} - 0.66$	0.891
"	14	$\log \frac{EPc}{P} = 1.13 \log \frac{DPc}{P} - 1.28$	0.926
"	16	$\log \frac{EP}{P} = 0.95 \log \frac{DBs}{P} - 0.47$	0.903
"	14	$\log \frac{EPc}{P} = 1.08 \log \frac{DBs}{P} - 0.86$	0.918
1955	19	$\log \frac{EP}{P} = 1.036 \log \frac{PNBf}{P} - 1.65$	0.851
"	17	$\log \frac{EPc}{P} = 1.145 \log \frac{PNBf}{P} - 1.98$	0.946
"	18	$\log \frac{EP}{P} = 0.98 \log \frac{DPc}{P} - 0.665$	0.894
"	16	$\log \frac{EPc}{P} = 1.006 \log \frac{DPc}{P} - 0.75$	0.940

N.B.: The meaning of the symbols used is given in Annex I.

CHAPTER II

INTERNATIONAL COMPARISON BETWEEN LEVELS OF EDUCATIONAL EXPENDITURE

50. The statistical data assembled in the enquiry by questionnaire have enabled a number of comparisons to be made between Member countries.

First, the relationship between educational expenditure on the one hand and national product and public expenditure on the other was studied for several different years (1965, 1960 and 1955) by using two aggregates for public expenditure on education (current and total), two concepts for public expenditure and two concepts for G.N.P. The results are given in Table IX. The most up-to-date comparison is based on data for 1965, because it was unfortunately not possible to obtain more recent statistics for all the Member countries together. Whichever concepts one uses (total or public expenditure on education, gross national product or national income, total or current public expenditure on goods and services), one finds a close correlation between educational expenditure per head and per capita income: in other words each country devotes to education a share of its resources proportionate to its level of economic development, and this level explains (statistically) from 85 to 90 per cent of the differences found in educational expenditure per head.

By and large the results of these cross-section analyses confirm those of the time-series analyses mentioned previously. The elasticity of educational expenditure in relation to national product is higher than in relation to public expenditure. When the data are plotted on graphs, the O.E.C.D. countries as a whole appear to be quite homogeneous. Furthermore, the relationships remained fairly stable during the ten years under review and the differences noticed between 1955, 1960 and 1965 do not seem to point to any significant trend. Most of the correlation rates are high, although lower than those noticed previously for the time series for each country; but these correlation rates (all very significant at the threshold of 1 per cent) do not seem to provide a sufficient criterion to allow the use of the cross-section comparisons as a reliable guide to probable developments in each country. Indeed, the elasticity (and correlation) coefficients are seen to vary rather irregularly with the number of countries included; thus, if Portugal, Spain and Greece, which are quite distinct from the remaining group of countries, are included in the calculations for the year 1965, the elasticity coefficient for educational expenditure in relation to national product goes up by 39 per cent. Likewise the differences found between equations based on neighbouring concepts (such as "current expenditure" and "total

expenditure" on education, or "current public expenditure" and "current public expenditure on goods and services") arise much more from variations in the number of countries in each sample than from significant variations in the relative position of the same countries from one period to another.

51. One may wonder whether converting educational expenditure into dollars at official rates of exchange does not load the calculations in favour of the richer countries, and it is true that an international comparison based on more detailed analyses shows appreciably narrower gaps between the figures derived from G.N.P. per head(1). In theory a conversion index could be calculated by expressing the main items of expenditure in the prices of one single country, or more simply by using as indices the average salaries of a first level teacher in the various countries. This method could not be used for lack of data, so a new set of calculations was made using the "parity rates" taken from National Accounts expressed in United States prices. In order to bring out the differences resulting from the use of these two conversion rates, both series have been worked out for the same countries, the same basic data and the years 1950, 1955, 1960 and 1965, but using the two different rates.

The results appear in Table X; it will be seen that there is no significant difference between the two series. So no better results seem to be reached by using a somewhat less artificial conversion rate than the official exchange rates.

52. Accordingly, it can be stated that educational expenditure per head is closely linked to the per capita income and to the public expenditure per head throughout the O.E.C.D. countries. Statistically the comparison reveals a high degree of correlation explaining from 85 to 90 per cent of the differences between the various countries. Can one conclude that international comparisons make it possible to forecast the future trend of educational expenditure in each country? That does not seem certain: the time elasticities found for each country are distinctly higher than the cross-section elasticities arrived at by comparing educational expenditure in all countries in a given year. To be sure, the cross-section correlations remain steady for a period of time, as may be seen by collating the results of the comparisons made for the years 1950, 1955, 1960 and 1965; but this may simply mean that throughout the period all the countries concerned made much the same efforts

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(1) Milton Gilbert et al., "Comparative National Products and Price Levels", O.E.E.C., 1958.

Wilfred Beckerman, "International Comparisons of Real Income", O.E.C.D. Development Centre, 1966.

TABLE X

Cross-section elasticities (O.E.C.D. countries)

Trends in public educational expenditure (per capita) as a proportion of G.N.P. and of public expenditure (per capita) in 1950, 1955, 1960 and 1965

Comparison of results obtained by applying official exchange rates and parity rates

Year	Number of countries	Regression equation	Correlation coefficient R
		AT EXCHANGE RATES (in $U.S.)	
1950	13	$\log \frac{EP}{P} = \underset{(0.103)}{1.085} \log \frac{PNB}{P} - 1.83$	0.953
"	10	$\log \frac{EPc}{P} = \underset{(0.141)}{0.847} \log \frac{DBS}{P} - 0.53$	0.904
		AT PARITY RATES	
"	13	$\log \frac{EP}{P} = \underset{(0.109)}{1.086} \log \frac{PNB}{P} - 1.84$	0.948
"	10	$\log \frac{EPc}{P} = \underset{(0.145)}{0.860} \log \frac{DBS}{P} - 0.54$	0.902
		AT EXCHANGE RATES (in $U.S.)	
1955	17	$\log \frac{EP}{P} = \underset{(0.173)}{0.89} \log \frac{PNBm}{P} - 1.18$	0.799
"	16	$\log \frac{EPc}{P} = \underset{(0.163)}{0.72} \log \frac{DBS}{P} - 0.12$	0.765
		AT PARITY RATES	
"	17	$\log \frac{EP}{P} = \underset{(0.172)}{0.82} \log \frac{PNBm}{P} - 0.95$	0.775
"	16	$\log \frac{EPc}{P} = \underset{(0.160)}{0.67} \log \frac{DBS}{P} - 0.003$	0.744
		AT EXCHANGE RATES (in $U.S.)	
1960	20	$\log \frac{EP}{P} = \underset{(0.098)}{1.359} \log \frac{PNB}{P} - 2.554$	0.956
"	18	$\log \frac{EPc}{P} = \underset{(0.103)}{1.117} \log \frac{DBS}{P} - 0.928$	0.937
		AT PARITY RATES	
"	20	$\log \frac{EP}{P} = \underset{(0.100)}{1.401} \log \frac{PNB}{P} - 2.711$	0.956
"	18	$\log \frac{EPc}{P} = \underset{(0.115)}{1.118} \log \frac{DBS}{P} - 0.951$	0.924
		AT EXCHANGE RATES (in $U.S.)	
1965	19	$\log \frac{EP}{P} = \underset{(0.124)}{1.409} \log \frac{PNB}{P} - 2.677$	0.939
"	17	$\log \frac{EPc}{P} = \underset{(0.124)}{1.183} \log \frac{DBS}{P} - 1.046$	0.926
		AT PARITY RATES	
"	19	$\log \frac{EP}{P} = \underset{(0.114)}{1.455} \log \frac{PNB}{P} - 2.842$	0.951
"	17	$\log \frac{EPc}{P} = \underset{(0.130)}{1.186} \log \frac{DBS}{P} - 1.07$	0.917

N.B.: The standard deviations are shown in brackets below the elasticity coefficients to which they relate.

in proportion to their resources. For the planner this discovery is not without importance. But it is of less consequence for forecasting than indications of the recent trend of educational expenditure in a given country, such as can be derived from the available time series. Broadly speaking, these cross-section comparisons can be considered as having a descriptive value which enables the respective position of each country to be determined with reference to all O.E.C.D. countries taken as a whole at a given moment; on the other hand, it does not seem possible to ascribe to them a predictive value which would justify using the parameters of the equations for projecting expenditure in terms of objectives of economic development or of forecasts of public expenditure.

For forecasting educational expenditure it seems preferable after all to go by the time trend observed in the country itself and to use the international comparisons for helping to form judgments rather than for making projections.

53. The data collected in the enquiry were also used in an attempt to verify a number of assumptions regarding the relationship between educational expenditure and economic growth. If education is regarded as an investment, the level of educational expenditure may be expected to "predict" the future level of the economy. So we set per capita income in 1965 against educational expenditure per head ten years earlier; the correlation is most significant and the elasticity coefficient of 0.62 could be taken as a marginal efficiency rate for investment in education.

54. But one can also reverse the direction of this causal relationship and treat education as collective consumption, by supposing that the level of educational expenditure depends on the level previously attained by the economy; one then finds that educational expenditure in 1965 is "explained" to the extent of 88 per cent by per capita income in 1960; and one finds a similar correlation between per capita income in 1955 and educational expenditure per capita five years earlier. So caution must be exercised in interpreting international comparisons based on macro-economic data: they are no more than guidelines for determining the respective positions of countries at a given moment; they provide neither a key to forecasting future trends, nor proof of a causal relationship.

55. International comparisons can also be used in seeking an explanation of the considerable differences, which were referred to earlier, between the growth rates for educational expenditure in different countries. The rate at which expenditure increases might be expected to depend on the dynamism of economic expansion: but collating the two series of growth rates reveals no meaningful relationship between the two. Nor is any correlation found between growth rates in educational expenditure and levels of

economic development; one can discern no tendency for the gaps between the various countries either to get steadily narrower or to get wider. Likewise, no meaningful results are obtained by taking the percentage of the G.N.P. devoted to the educational system as a measure of national effort in favour of education: the correlation of this index with per capita income is very low, as it is also with rates of economic growth.

56. It may be concluded from this set of comparisons between O.E.C.D. countries that the level of educational expenditure is proportionate to the resources of each country, but that the financial effort exerted during the last 15 years is not explained by economic factors. At this macro-economic analysis level one cannot confirm (nor invalidate) the propositions which maintain that education expands in response to a "demand" from the economy expressed in the form of requirements for qualified manpower, or that growth in the educational system conditions economic progress. But no more can one conclude that on the contrary the development of educational systems should be regarded as mere "consumption expenditure" depending either on the level of economic development or on the growth of national income.

It would be valuable to investigate the non-economic factors which appear to have determined the particular rate of growth in educational expenditure in each of the countries under review. The fact that it has grown so steadily during the period concerned suggests that long-term social or political factors are at work, apparently almost unaffected by the fluctuations of the economy or by educational policy decisions.

CHAPTER III

PROSPECTIVE TRENDS IN EDUCATIONAL EXPENDITURE UP TO 1980

57. How to tell what will be the development of educational expenditure during the next decade is a question which is being asked more and more. There can be no satisfactory answer, because this is only one aspect of educational policy; the desirable level of educational expenditure should be fixed in terms of clearly stated criteria, once the social and economic objectives, and the efficiency of the means to be used to achieve them, have been specified. But the growth of expenditure on education has been so fast during the last 15 years that it was bound to be detrimental to other sectors, so that the question arises whether a physical limit will not soon be reached.

58. In an attempt to answer this question a series of global extrapolations of educational expenditure has been worked out so as to see what would happen if the growth rates of the last 15 years were to continue up to 1980. The calculation disregards the separate factors which caused the growth (demographic growth, enrolment policy, teaching standards, etc.) and takes account only of the global volume of expenditure on education, which implies that the same growth factors will continue to operate in the same way. So it is only a first approximation, based primarily on the steady rate, referred to earlier, at which expenditure has increased.

59. There were, a priori, several possible procedures for making the calculation. Three have been used to permit the collating of their results:

(a) The annual growth rate for educational expenditure, using the adjusted trends taken from the time series for the last ten or fifteen years (according to the rates of assumption B).

(b) The elasticity of educational expenditure in relation to gross national product, using the projections in the O.E.C.D. study on economic growth from 1970 to 1980(1) and the regression equations given earlier (according to assumption B).

(c) The rise in the percentage of G.N.P. devoted to education, using an extrapolation of the growth (exponential) recorded in the recent past.

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(1) "The Growth of Output in O.E.C.D. countries 1960-1980" [CPE/WP2(70)1].

The three sets of figures thus worked out for educational expenditure in 1980 were then expressed as percentages of the figures for gross national product and public expenditure which the O.E.C.D. had projected for the same year.

60. The results of the three methods of extrapolation are given in Tables XI, XII and XIII. They are seen to be quite close together for half the countries studied, but fairly far apart for the others. So it is advisable to use several forecasting methods jointly rather than only one, because the importance of this possible cause of uncertainty appears only a posteriori.

The results of the extrapolations do not point to any obvious limits to the continuation of the trends observed hitherto, at least for the majority of O.E.C.D. countries and insofar as the expected economic growth (5.1 per cent per year from 1970 to 1980 for O.E.C.D. countries as a whole) actually takes place. The percentage of G.N.P. devoted to education in 1980 would be less than 6 per cent for five countries (including Germany and Japan); it would be below 10 per cent for six other countries; for eight countries it could be over 10 per cent.

61. These same extrapolations, when expressed as percentages of public expenditure (Table IX), strengthen the impression that in most countries limits could quickly be reached to the continuation of the recent expansion. For 12 countries out of 19, a continuation of current growth rates would involve allocating over 20 per cent of public expenditure to the educational system, a figure which only two countries have reached so far. In four or five countries the figure would even exceed 30 per cent, which seems hardly realistic in the light of present-day international experience.

62. Before trying to interpret these results the limitations of the extrapolations should be recalled: they disregard all factors influencing the trend of expenditure, assuming implicitly that their overall effect will be just the same in the future as it has been in the past. Extrapolation is concerned with stating only what would happen if past trends were continued into the future, all things being equal and undisturbed by any deliberate action. It can do no more than provide guidance in choosing between options; it is not a proper forecast, still less a method for fixing planning targets. On the contrary, there remains the compelling need to take account of all the factors affecting costs and to examine the financial implications of the options.

63. Reduced to this modest role, extrapolations can help to determine the limits of what is possible in the light of experience in other countries. It may be thought, for example, that without a radical change in social attitudes and behaviour the period of accelerated growth in educational expenditure cannot continue indefinitely without meeting with resistance

TABLE XI

Extrapolation of public educational expenditure up to 1980 by the three methods, and results in percentages of G.N.P.

Country	Annual growth rate of educational expenditure (in %)	% E / G.N.P. in 1980	% E / G.N.P. in 1967	Extrapolation of E / G.N.P. in 1980	Elasticity E / G.N.P.	Extrapolation in 1980 (in %) E / G.N.P.
Germany	9.3	5.4	2.96 (66)	3.9	1.38	3.7
Austria	9.3	7.8	4.40	6.1		6.9
Belgium	8.6	10.0	5.57	8.4	1.74	7.8
Canada	13.5	17.3	5.65 (65)	20.5	2.92	17.0
Denmark	11.4	15.0	6.12	13.0	2.21	10.1
Spain	12.8	4.9	2.15 (68)	4.5	2.60	4.7
United States	8.2	8.2	6.12	8.6	1.98	7.9
Finland	7.5	9.0	6.43	8.0		7.8
France	11.0	9.0	4.81	9.4	2.08	9.0
Greece			1.89 (64)			
Ireland	5.7	5.4	4.23	6.8	2.60	8.0
Iceland	12.5		4.80			
Italy	13.2	13.2	5.44	13.0	2.00	11.0
Japan	10.2	4.1	4.54 (65)	4.1	1.01	4.6
Luxembourg		8.2	4.30 (65)	9.2		
Norway	7.4	8.4	5.81	11.2	1.85	8.8
Netherlands	11.4	15.2	6.71	14.8	2.30	12.0
Portugal	6.5	1.4	1.53 (65)	1.9	1.19	1.7
United Kingdom	8.2	8.8	4.15 (65)	8.2	2.47	7.0
Sweden	11.4	16.5	7.40 (66)	16.5	2.05	11.3
Switzerland	7.9	7.4	3.62 (64)	3.7	1.56	4.6
Turkey(a)	9.5	7.0	3.70	7.8		
Yugoslavia(a)	17.5	12.0	4.50			

(a) Public expenditure is equal to total expenditure, according to the sources available.

N.B.: Projections of G.N.P. for 1980 have been taken from the O.E.C.D. study on economic growth [CPE/WP2(69)13]. Gross national product is quoted at market prices.

- The growth rates of educational expenditure which have been used here are those of assumption B (see Table I); the same applies to the elasticities.

TABLE XII

Extrapolation of total educational expenditure up to 1980
in percentages of G.N.P. (at market prices)

Country	Annual growth rate of educational expenditure (in %)	% Et / G.N.P. in 1980	% Et / G.N.P. in 1967	Extrapolation of E / G.N.P. in 1980	Elasticity E / G.N.P.	Extrapolation in 1980 (in % E / G.N.P.)
Germany	9.3	5.6		3.7	1.38	3.8
Canada(a)	13.5	19.4		23.8	2.92	19.0
Spain			3.0	5.0		
United States	8.5	11.2	6.8	11.6		
Finland	7.9	11.5	7.8	9.2		
France			4.9	9.4		
Greece	12.2	3.9	2.0 (66)	4.0		
Iceland	12.5	15.0	4.8	7.3	2.3	7.0
Japan			5.7	6.1		
Norway	7.1	8.4	6.0	11.3		
Netherlands	10.6	14.2	7.0	14.2		
Turkey	9.5	7.0	3.7	7.8		
Yugoslavia	17.5	12.0				

(a) Total expenditure (from public and private funds) for public education.

TABLE XIII

Extrapolation of public educational expenditure up to 1980

in percentages of total public expenditure

Country	% Ep / DP in 1967	% Ep / DP in 1980 Method of the trend	% Ep / DP in 1980 Method of the percentage EP / G.N.P.	% Ep / DP in 1980 Method of the elasticity E / G.N.P.
Germany	7.87 (66)	12.23	8.65	8.20
Austria	11.63	18.31	14.60	16.4
Belgium(*)	18.03	22.6	24.2	18.4
Canada	18.14 (65)	49.2	56.4	48.8
Denmark	17.81	40.10	34.78	27.15
United States	16.3	24.00	24.25	23.00
Finland	17.89		18.22	
France	11.77	18.1	19.00	18.3
Ireland	11.76 (66)	19.87	25.66	30.69
Iceland	13.29 (66)	37.84	19.81	16.49
Italy	14.37 (65)	31.3	31.21	25.55
Japan	22.12 (65)	22.9	23.6	25.5
Luxembourg(*)	14.54 (65)		28.38	
Norway	15.08	17.2	20.7	17.6
Netherlands	15.08	28.03	27.61	22.79
Portugal	9.4 (61)		16.2	
United Kingdom	11.42 (65)	24.3	22.56	19.7
Sweden(*)	22.0 (66)	40.00	42.00	28.00
Switzerland(*)	17.3 (64)	26.7	13.2	16.9

N.B. Projections of public expenditure for 1980 have been taken from the O.E.C.D. study on economic growth [CPE/WP2(69)13]. For countries marked with an asterisk (*), the figures refer to current public expenditure, the only information available. For the other countries the figures refer to total public expenditure including interest on the public debt, gross fixed asset formation in the public sector, public expenditure on goods and services, transfers and subventions.

from other sectors of the economy. Where are these limits? International comparisons show that no country has yet reached the limit of 8 per cent of G.N.P. devoted to education. Even after allowing for the fact that this "ceiling" has been raised considerably during the last 15 years, it looks as if the growth rates will slow down on approaching it and the curve will probably flatten out before reaching 10 per cent.

64. It seems possible to distinguish three groups of countries. A first group from five to seven countries, would exceed the 10 per cent share of G.N.P. devoted to education, and four might exceed 15 per cent. It seems most likely that there will soon be a reversal of the present trend, bringing with it a risk of tension if the enrolment rate and unit costs keep on tending to rise.

65. A second group, of six countries, would lie between 8 and 10 per cent. The rates of growth in educational expenditure for this group are likely to slow down before 1980. At what moment will the curve flatten out? There are no criteria available for deciding this, and no international experience either, since the prevailing growth seems to be continuing even in the countries which have already reached the highest figures. But it is important for these countries to start preparing for this eventuality forthwith, by providing themselves with tools for bringing costs of education progressively under control.

66. A further group, from eight to ten countries, would not reach the 8 per cent figure in 1980, and five of them would stay below 6 per cent. The latter appear capable of maintaining their recent growth rates, and three of them, whose present level seems abnormally low compared with the other countries, might even manage higher rates.

67. It is in fact possible that the effects of the reversal of the trend predicted for groups 1 and 2 are already being felt. It is apparent even now that in the last two years there have been changes in that direction in some countries (United Kingdom, France), but unfortunately the data for the enquiry stop at 1966 or 1967, which makes it impossible to check whether the tendency is general.

68. How will the change come about? Demographic pressure will be felt less (except in Germany and Austria), since the rise in births which distinguished the post-war period has levelled off pending the time when the new generations (born from 1946 onwards) will, in turn, have children of school age. But we have seen that demographic factors have played only a small part in raising educational expenditure. Moreover, all the educational reforms under way or in preparation tend to lengthen the period of schooling, to speed up the increase in

the numbers of students receiving higher education, and to raise costs of education. It is therefore likely that the contradiction between a continued growth of enrolments and the resistance to a continued rise of education's share in the national product will create tension which planners should try to foresee and reduce.

CONCLUSION

69. The enquiry occasioned by this study has disclosed that most Member countries do not yet possess the minimum of information they would require in order to know what their expenditure on education is, to foresee it and control it. Progress must be made in this field. However, if henceforth educational policies have to strive to control the volume of expenditure, they cannot be confined to improving the knowledge of global financial data; it will be necessary to analyse the cost prices of education, to lay down efficiency criteria and to develop research and innovation as constituent elements of a policy for educational growth.

An analysis of educational expenditure (particularly at global level) is not sufficient basis for defining the options for an educational policy, and still less for laying down criteria for choosing between them, or for determining policy objectives. But it does provide indispensable pointers to the behaviour of the educational system. It yields international comparisons which help to place national problems in a wider context; it is a condition of further progress towards framing an educational policy which should include a control of costs and returns.

ANNEX

Abbreviations

Dependent variables

1.	Public expenditure on education	Ep
2.	Current public expenditure on education	Epc
3.	Expenditure on public education	EDp
4.	Current expenditure on public education	EDpc
5.	Total expenditure on education	Et
6.	Total current expenditure on education	Etc
7.	Budget of the Ministry of Education	BEN
8.	Total expenditure on higher education	U
9.	Current expenditure on higher education	Uc

Independent variables

10.	Gross National Product at factor cost	PNBf
11.	Gross National Product at market prices	PNBm
12.	National Income	RN
13.	Total public expenditure (current and capital)	DP
14.	Current government expenditure	DPc
15.	Current government expenditure on goods and services	DPbs
16.	Total population	P

Country Code

1.	Germany	D	13.	Italy	I
2.	Austria	A	14.	Japan	JPN
3.	Belgium	B	15.	Luxembourg	L
4.	Canada	CDN	16.	Norway	N
5.	Denmark	DK	17.	Netherlands	NL
6.	Spain	E	18.	Portugal	P
7.	United States	USA	19.	United Kingdom	UK
8.	Finland	SF	20.	Sweden	S
9.	France	F	21.	Switzerland	CH
10.	Greece	GR	22.	Turkey	TR
11.	Ireland	IRL	23.	Yugoslavia	YU
12.	Iceland	ISL			